



## City-scale integrated assessment of climate impacts, adaptation and mitigation

---

<b>Author(s):</b>	Dawson R, Hall J, Barr S, Batty M, Bristow A, Carney S, Dagoumas A, Evans S, Ford A, Kohler J
<b>Conference:</b>	International Alliance of Research Universities (IARU) International Scientific Congress on Climate Change: Global Risks, Challenges and Decisions held 10-12 March 2009 (Copenhagen, Denmark)
<b>Year:</b>	2009
<b>Publisher:</b>	Institute of Physics (IOP) Conference Series: Earth and Environmental Science
<b>Volume:</b>	6
<b>Page:</b>	332008

---

### Abstract:

Over half the global population live in cities whilst urban greenhouse gas emissions are already a significant driver of global climate change. Consequently, cities have become foci for adaptation and mitigation efforts worldwide and are faced with the challenge of designing and implementing the transition to a state in which their greenhouse gas emissions are drastically reduced and they are well adapted to the impacts of climate change. There is increasing understanding of the synergies and conflicts in the objectives of mitigation and adaptation. These interactions are no more vivid than in urban areas, where they play out through land use, infrastructure systems and the built environment. Without sensible planning, climate change can induce energy-intensive adaptations such as air conditioning or desalination, driving emissions further. Urban decision makers need to understand the implications of these interactions and the potential influences of future global changes. If they can test, through simulation, alternative policies and assess them from a multiattribute point of view, they are more likely to avoid the mistakes of the past. On the scale of large cities it is meaningful to think about climate impacts, adaptation and mitigation in the same quantified assessment framework. This is a scale at which strategies for mitigation and adaptation can be usefully designed and assessed. It is increasingly also the scale at which individual civil servants in city administrations are being given responsibility for climate protection. With these decision makers in mind, the Tyndall Centre for Climate Change Research has for the last three years been developing an Urban Integrated Assessment Facility (UIAF) which seeks to simulate socioeconomic change, climate impacts and greenhouse gas emissions over the course of the 21st century. The research is focussed upon London, UK, a city that has taken a lead role in the UK and globally with respect to climate protection. The structure of the integrated assessment is illustrated in Figure 1. Global climate and economics scenarios provide the boundary conditions for the city scale analysis. The climate scenarios are downscaled to the city scale using results from a new land surface scheme in the Hadley Centre's regional climate model. A range of global and national economic and demographic scenarios have been explored, which provide the boundary conditions for the MDM-E3 regional economics model. MDM-E3 is a dynamic multi-sector model which provides projections throughout the 21st Century for employment and GVA in 42 economic sectors. Employment is disaggregated spatially and is combined with information on the transport network, along with other land use attractors, in a land use model that operates at the ward scale. A variety of transport network scenarios, involving different levels of infrastructure investment, have been explored. The land use model is

disaggregated further to a 50m grid, which is used for spatial analysis of climate impacts, including flood risk and heat stress. The risk of drought (which is significant in London) is computed at a city scale.

**Source:** <http://dx.doi.org/10.1088/1755-1307/6/3/332008> <http://iopscience.iop.org/1755-1315/6/33/332008>

## Resource Description

### Exposure :

weather or climate related pathway by which climate change affects health

Extreme Weather Event, Temperature, Unspecified Exposure

**Extreme Weather Event:** Drought, Flooding

**Temperature:** Extreme Heat

### Geographic Feature:

resource focuses on specific type of geography

Urban

### Geographic Location:

resource focuses on specific location

Non-United States

**Non-United States:** Europe

**European Region/Country:** European Country

**Other European Country :** United Kingdom

### Health Impact:

specification of health effect or disease related to climate change exposure

General Health Impact

### Mitigation/Adaptation:

mitigation or adaptation strategy is a focus of resource

Adaptation, Mitigation

### Model/Methodology:

type of model used or methodology development is a focus of resource

Methodology

### Resource Type:

format or standard characteristic of resource

Policy/Opinion

# Climate Change and Human Health Literature Portal

## **Timescale:**

time period studied

Time Scale Unspecified

## **Vulnerability/Impact Assessment:**

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content